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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/672,442	09/26/2003	Chandandumar Aladahalli	DB001050-001	8430
24122 7590 02/11/2008 THORP REED & ARMSTRONG, LLP ONE OXFORD CENTRE 301 GRANT STREET, 14TH FLOOR PITTSBURGH, PA 15219-1425			EXAMINER HIRL, JOSEPH P	
			ART UNIT 2129	PAPER NUMBER
			MAIL DATE 02/11/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/672,442

Applicant(s)

ALADAHALLI ET AL.

Examiner

Joseph P. Hirl

Art Unit

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 November 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-24 and 26-44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-24 and 26-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. This Office Action is in response to an RCE entered November 30, 2007 for the patent application 10/672,442 filed on September 26, 2003.
2. All prior office actions are fully incorporated into this Office Action by reference.

### ***Status of Claims***

3. Claims 1, 2, 4-24 and 26-44 are pending in this application.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Examiner's Note (EN): See Examiner's response below concerning an interview in preparation for allowance.

5. Claims 1-44 are rejected under 35 U.S.C. 102(e) as being anticipated by Lundahl et al (USPN 6,636,862, referred to as **Lundahl**).

**Claims 1, 23**

Lundahl anticipates performing a pattern-based search on a computer by successively generating a plurality of new component configurations by applying a plurality of moves and evaluating an objective function at each of said plurality of new configurations until a final configuration is selected and output, and wherein a criterion other than the size of the move is used to determine the order in which the moves are applied (Lundahl, abstract; c15:35-43).

**Claims 2, 24**

Lundahl criterion for selecting the move to be applied is based on an amount of change in value of said objective function, with that move expected to cause the greatest amount of change in value of the objective function being selected next (Lundahl, c 38:19-54; EN: selection of such value is the optimization process).

**Claims 4, 26**

Lundahl anticipates determining the effect of a plurality of moves on a set of components (Lundahl, c 38:19-54; EN: component moves are those characteristics that make up the objective function); organizing said plurality of moves into sensitivity groups according to the effect the moves have on said set of components (Lundahl, c 15:35-43 ; EN: density is equivalent to sensitivity); selecting a sensitivity group (Lundahl, c 15:35-43); picking one move from said set of moves in said selected sensitivity group and applying said move to a saved configuration of components (Lundahl, c 15:35-43; network is the saved configuration of components); evaluating a new configuration resulting from applying said move, and if said new configuration is

improved, saving said new configuration, if said new configuration is not improved, discarding said new configuration (**Lundahl**, c 15:44-55); continuing until no moves from said set of moves from said selected sensitivity group result in an improved configuration (**Lundahl**, c 15:44-55); determining if more sensitivity from said set of moves from said selected sensitivity group result in an improved configuration (**Lundahl**, c 15:44-55); and determining if more sensitivity groups are available, and if no, outputting said saved configuration, and if yes, returning to said selecting a sensitivity group step (**Lundahl**, c 15:27-55).

**Claims 5, 27**

Lundahl anticipates said determining the effect includes ranking each of said plurality of moves based on an amount of change each move is expected to have on an objective function and wherein said organizing includes ordering said moves from highest to lowest ranking (**Lundahl**, c 32:5-22).

**Claims 6, 12, 17, 22, 28, 34, 39, 44**

Lundahl anticipates said ranking includes one of analytically, probabilistically and heuristically ranking (**Lundahl**, c 32:5-22; EN: analytically concerns any numeric process).

**Claims 7, 13, 18, 29, 35, 40**

Lundahl anticipates dividing the range between highest and lowest rankings into a plurality of intervals, and wherein said organizing includes assigning each of the moves to one of said intervals (**Lundahl**, c 32:5-22; EN: ¶ 15 applies; moves refer to any change in a variable or metric).

**Claims 8, 14, 19, 30, 36, 41**

Lundahl anticipates assigning is performed according to one of a geometric progression based on said rankings and said rankings themselves (**Lundahl**, c 32:5-22; EN: ¶ 15 applies).

**Claims 9, 31**

Lundahl anticipates determining the effect includes deriving a function that qualifies the effect each move has on the change in an objective function (**Lundahl**, c 38:19-32; EN: moves are synonymous with changes to the objective function).

**Claims 10, 15, 20, 32, 37, 42**

Lundahl anticipates determining the effect includes determining the non-intersecting volume between an object and itself after applying a move (**Lundahl**, c 2:36-55; EN: the non-interesting volume between something and itself is the region excluding something or it is just the cluster).

**Claims 11, 16, 33, 38**

Lundahl anticipates ranking each of a plurality of moves on a set of components based on the effect each move is expected to have on an objective function; and storing the ranking for use in ordering the moves within a computer program for performing a pattern based search from those moves having the highest ranking to those moves having the lowest ranking (**Lundahl**, c9:28-44; c 38:34-54; EN: calibration process).

**Claims 21, 43**

Lundahl anticipates deriving a function that relates moves to expected changes in an objective function and storing said function for use in organizing the moves within a computer program for performing a pattern-based search (**Lundahl**, c9:28-44; c 38:19-32; EN: such is the maximizing of the objective function).

***Response to Arguments***

6. Applicant's arguments filed on November 30, 2007 related to Claims 1, 2, 4-24 and 26-44 have been fully considered but are not persuasive.

In reference to Applicant's argument:

Lundahl is directed to a method and system for the dynamic analysis of data represented in distinct matrices. If two data matrices X and Y are present in which corresponding rows of X and Y each refer to the same underlying object, a relationship can be developed between the X and Y data matrices, which allows for a prediction of responses in Y on the basis of inputted X- data. If a third data matrix Z is present in which corresponding columns of Y and rows of Z each refer to the same underlying object, a relationship can be developed between the X, Y, and Z data matrices. [Lundahl, Abstract] Lundahl has nothing to do with pattern based searching, as that phrase is used in the present application. See Second Declaration of Dr. Aladahalli, paragraphs 8 and 9.

Examiner's response:

¶ 10. applies. Applicant is reminded that limitations appearing in the specification but not recited in the claim are not read into the claim, that the claims and only the claims form the metes and bounds of the invention and the Examiner has full latitude to interpret each claim in the broadest reasonable sense. The issue is not one concerning whether Lundah does pattern based searching, but can the claim as written be interpreted to be anticipated by Lundah. A pattern base search can be broadly

interpreted to be the development of relationships between X, Y, and Z ... a pattern based search is a relationship process among pattern X, pattern y and pattern z.

In reference to Applicant's argument:

Lundahl, at column 38, lines 19-54 and column 42, lines 20-32 does not disclose or suggest using any criterion for determining the order in which moves are applied, and certainly does not disclose or suggest a criterion other than the normally accepted "move size" to determine the order in which the moves are applied. Because the cited portions of Lundahl are silent on how the order of application of the moves is determined, claims 1 and 23 are believed to be patentable over the Lundahl reference.

Examiner's response:

¶ 10. applies. Lundahl (Optimization within the Data Space) selects data order by density (Kohonen Self Organizing Maps, T. Kohonen, "Self-organized formulation of topologically correct feature maps," 43 Biol. Cybern, pps 59-69 (1982), incorporated by reference) (Lundahl, c15:35-43).

In reference to Applicant's argument:

The cited portion of Lundahl does not disclose or suggest determining which moves have the greatest effect on the objective function and applying those moves before applying moves having a lesser effect on the objective function. Claims 2 and 24 are believed to be in condition for allowance.

Examiner's response:

¶ 10. applies. Lundahl requires variable constraints such as lower and upper bounds on the variable used in the objective function. Applicant's limiting effect to moves that have the greatest effect on the objective function is equivalent to limitations placed on the variable (upper and lower bounds) (Lundahl, c38:34-54).

In reference to Applicant's argument:



Claims 4 and 26 have been substantially amended. The limitations of "performing a pattern based search" and "outputting a component layout" have been replaced with the steps needed to perform the search. Furthermore, unlike claims 1 and 23, which recite that a criterion other than step size is used to determine the order in which the moves are applied, claims 4 and 26 recite what that criterion is - sensitivity, i.e., the effect the moves have on a set of components determines the order in which the moves are applied. Those moves which cause a greater effect are applied first, regardless of the size of the those moves. Unlike a traditional pattern based search in which the moves are applied according to size, with the largest moves applied first, and then gradually smaller and smaller moves, the claimed method applies those moves having the greatest effect first, followed by moves that have a progressively smaller effect. The methods recited in claims 4 and 26 represent a completely different methodology for performing pattern based searches and proceed contrary to the art. The cited portions of Lundahl are silent with respect to using the effect that moves have on an objective function to determine the order in which moves should be applied.

Examiner's response:

¶ 10. applies. Lundahl requires variable constraints such as lower and upper bounds on the variable used in the objective function. Applicant's limiting effect to moves that have the greatest effect on the objective function is equivalent to limitations placed on the variable (upper and lower bounds) (Lundahl, c38:34-54).

In reference to Applicant's argument:

Lundahl does not recognize using an expected change in objective function to determine the order in which moves are applied, so it follows that Lundahl does not disclose the details of these dependent claims regarding the specifics of how to order or rank the moves.

Examiner's response:

¶ 10. applies. Ranking the amount of change each move is expected to have on an objective function can be interpreted to be considering values for a variable that are inside and outside the range determined by the upper and lower bounds for the variable of the objective function and such moves would be either in the range or out of the range (Lundahl, c38:18-54).

In reference to Applicant's argument:

There is nothing in the cited portion of Lundahl that discloses "a set of components" or "ranking each of the plurality of moves on a set of components based on the effect each move is expected to have on an objective function." Furthermore, Lundahl does not disclose "storing the ranking for use in ordering the moves from those moves having the highest ranking to those moves having the lowest ranking."

Examiner's response:

¶ 10. applies. a set of components can be interpreted to be a set of values contained in the range of the upper and lower bounds. Ranking the amount of change each move is expected to have on an objective function can be interpreted to be considering values for a variable that are inside and outside the range determined by the upper and lower bounds for the variable of the objective function and such moves would be either in the range or out of the range. Storing the ranking is interpreted to be storing of data (Lundahl, c9:28-44; c38:18-54).

In reference to Applicant's argument:

The methods recited in claims 11 and 16 and apparatus of claims 33 and 38 are directed to the process of determining which moves are expected to have the greatest effect (positive or negative) on the objective function. That information is used to guide the order in which the moves are applied during a pattern based search. It is during the search that the objective function is evaluated to see if the move represents an improvement. This "preprocessing" concept, i.e., determining which moves are expected to have the greatest effect on the objective function, is not disclosed or suggested in Lundahl. Claims 11, 16, 33, and 38 are believed to be patentable over Lundahl

Examiner's response:

¶ 10. applies. The ranking each of a plurality of moves on a set of components based on the effect each move is expected to have on an objective function can be interpreted as a calibration process with ranking (Lundahl, c32:5-22). Applicant is reminded that that limitations appearing in the specification but not recited in the claim are not read into the claim, that the claims and only the claims form the metes and

bounds of the invention and the Examiner has full latitude to interpret each claim in the broadest reasonable sense.

In reference to Applicant's argument:

Independent claims 21 and 43 are also directed to this preprocessing method of determining which moves are expected to have the greatest effect (positive or negative) on the objective function. That information is used to guide the order in which the moves are applied during a pattern based search. It is during the search that the objective function is evaluated to see if the move represents an improvement. Lundahl, as previously stated, does not recognize this preprocessing method. Claims 21, 22, 43, and 44 are believed to be patentable over Lundahl.

Examiner's response:

¶ 10. applies. Lundahl methodology relating to ranking and discriminatory power of the X-classification variables, for example, applies (Lundahl, c32:5-22).

In reference to Applicant's argument:

The applicants have made a diligent effort to place the instant application in condition for allowance. If the examiner is of the opinion that the instant application is in condition for disposition with respect to the art currently of record other than through allowance, the examiner is respectfully requested to contact applicants' attorney at the telephone number listed below so that an interview may be scheduled before the issuance a final Office action rejecting the claims.

Examiner's response:

The instant examination is non-final. The applicant's amendments do represent appropriate diligence to move the claims into allowance. However, more work needs to be done .... primarily in the independent claims. Applicant is encourage to consider ¶¶ 7.- 9. below. This material is from the MPEP and it is important. Part of the problem is the lack of succinct definitions in the specification for terminology used in the claims.

Under such conditions, generic definitions apply. As an example, what does "new component configurations" in claim 1, 23 mean? What does "set of components" mean

in claims 4, 11, 16, 26 and 38? These questions are asked because the terms can be interpreted generically and can mean anything ... remember that the Examiner is required to interpret the claims in the broadest reasonable manner. The preprocessing claims 11, 16, 21, 33, 38 and 43 are simply too generic and invite the application of other prior art. The preprocessing claims need to be further limited or cancelled from the application. Examiner invites the applicant to schedule an interview and to begin final work to move this application into condition for allowance.

### ***Examination Considerations***

7. The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, I 45-48; p 2100-9, c 1, I 1-4). The Examiner has full latitude to interpret each claim in the broadest reasonable sense. Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

8. Examiner's Notes are provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art

and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

9. Unless otherwise annotated, Examiner's statements are to be interpreted in reference to that of one of ordinary skill in the art. Statements made in reference to the condition of the disclosure constitute, on the face of it, the basis and such would be obvious to one of ordinary skill in the art, establishing thereby an inherent prima facie statement.

10. Examiner's Opinion: ¶¶ 7. – 9. apply. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.

### ***Conclusion***

11. Claims 1, 2, 4-24 and 26-44 are rejected.

### ***Correspondence Information***

12. Any inquiry concerning this information or related to the subject disclosure

Application/Control Number:  
10/672,442  
Art Unit: 2129

Page 13

should be directed to the Primary Examiner, Joseph P. Hirl, whose telephone number is (571) 272-3685. The Examiner can be reached on Monday – Thursday from 5:30 a.m. to 4:00 p.m.

As detailed in MPEP 502.03, communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant recorded in the applicant's file, the USPTO will not respond via e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate patent application. The following is an example authorization which may be used by the applicant:

Notwithstanding the lack of security with Internet Communications, I hereby authorize the USPTO to communicate with me concerning any subject matter related to the instant application by e-mail. I understand that a copy of such communications related to formal submissions will be made of record in the applications file.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, David R. Vincent can be reached at (571) 272-3080.

Any response to this office action should be mailed to:

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Application/Control Number:  
10/672,442  
Art Unit: 2129

Page 14

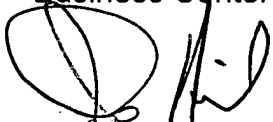
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(located on the first floor of the south side of the Randolph Building);

or faxed to:

(571) 273-8300 (for formal communications intended for entry.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have any questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).



Joseph P. Hirl  
Primary Examiner  
February 6, 2008